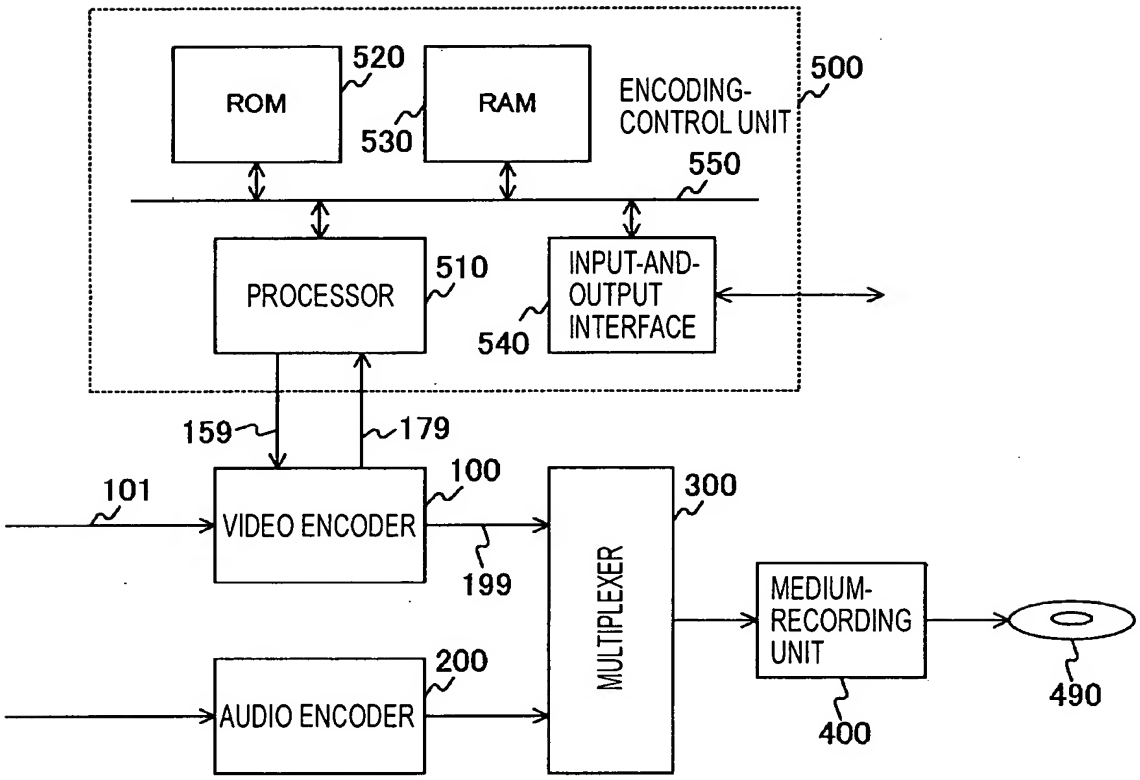
ROM
520
RAM
530
ENCODING-
CONTROL UNIT
500
550
PROCESSOR
510
INPUT-AND-
OUTPUT
INTERFACE
540
159
179
101
VIDEO ENCODER
100
199
300
MULTIPLEXER
MEDIUM-
RECORDING
UNIT
400
490
AUDIO ENCODER
200

FIG. 1

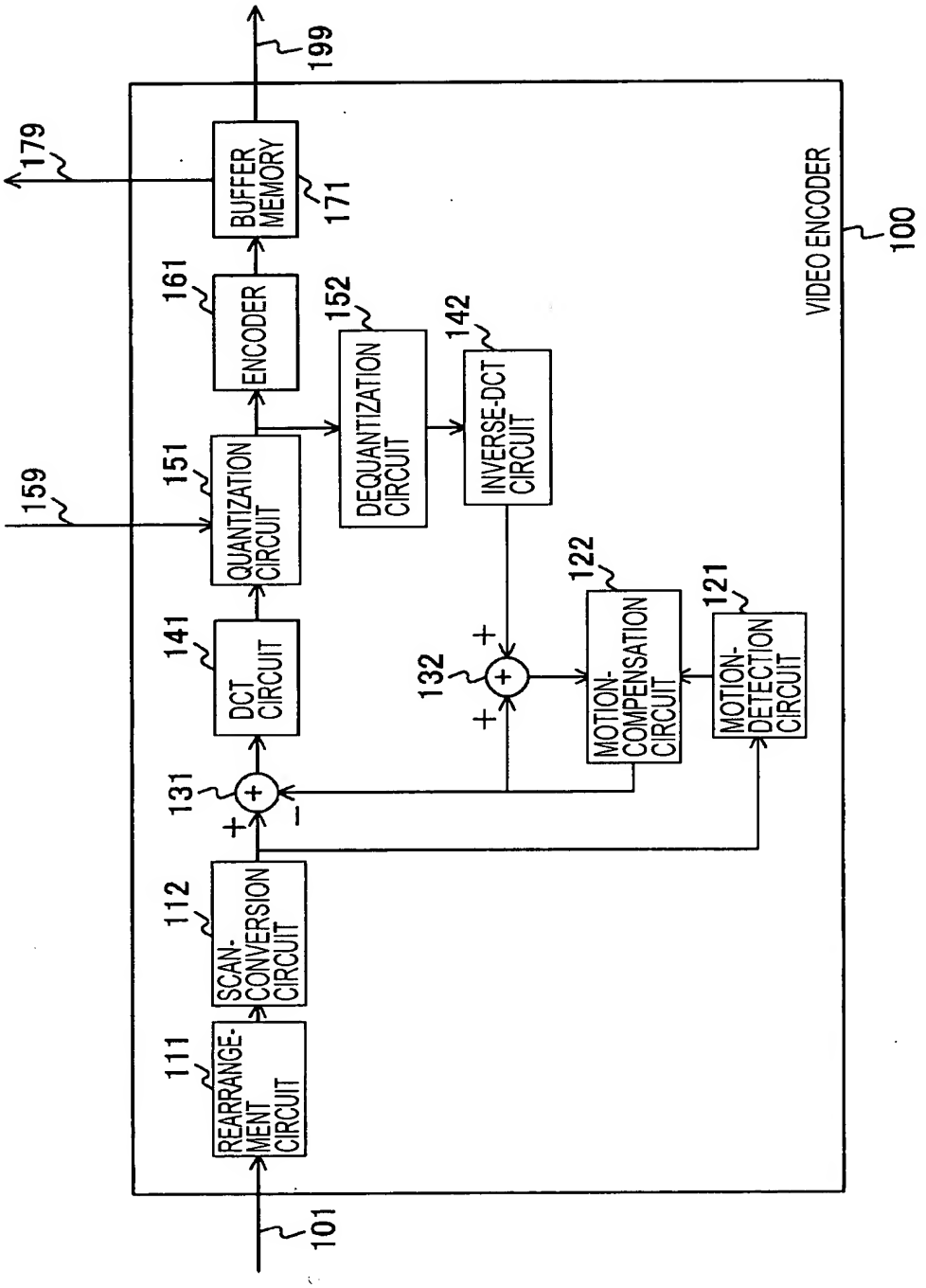
VIDEO ENCODER
100
101
199
179
159
111
REARRANGE-MENT CIRCUIT
112
SCAN-CONVERSION CIRCUIT
131
141
DCT CIRCUIT
151
QUANTIZATION CIRCUIT
161
ENCODER
171
BUFFER MEMORY
152
DEQUANTIZATION CIRCUIT
142
INVERSE-DCT CIRCUIT
132
122
MOTION-COMPENSATION CIRCUIT
121
MOTION-DETECTION CIRCUIT

FIG. 2

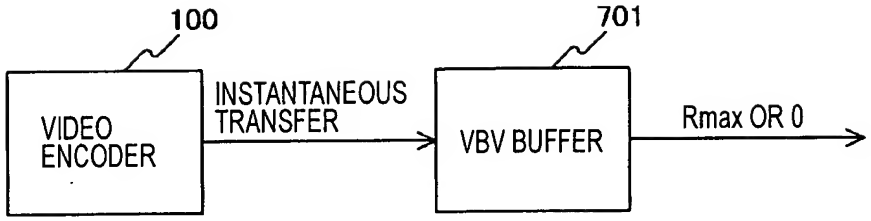
100
701
VIDEO ENCODER
INSTANTANEOUS TRANSFER
VBV BUFFER
Rmax OR 0

FIG. 3A

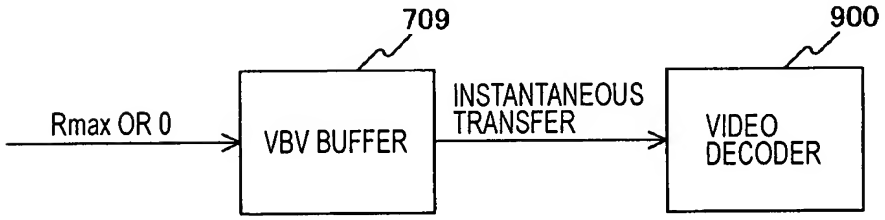
709
900
Rmax OR 0
VBV BUFFER
INSTANTANEOUS TRANSFER
VIDEO DECODER

FIG. 3B

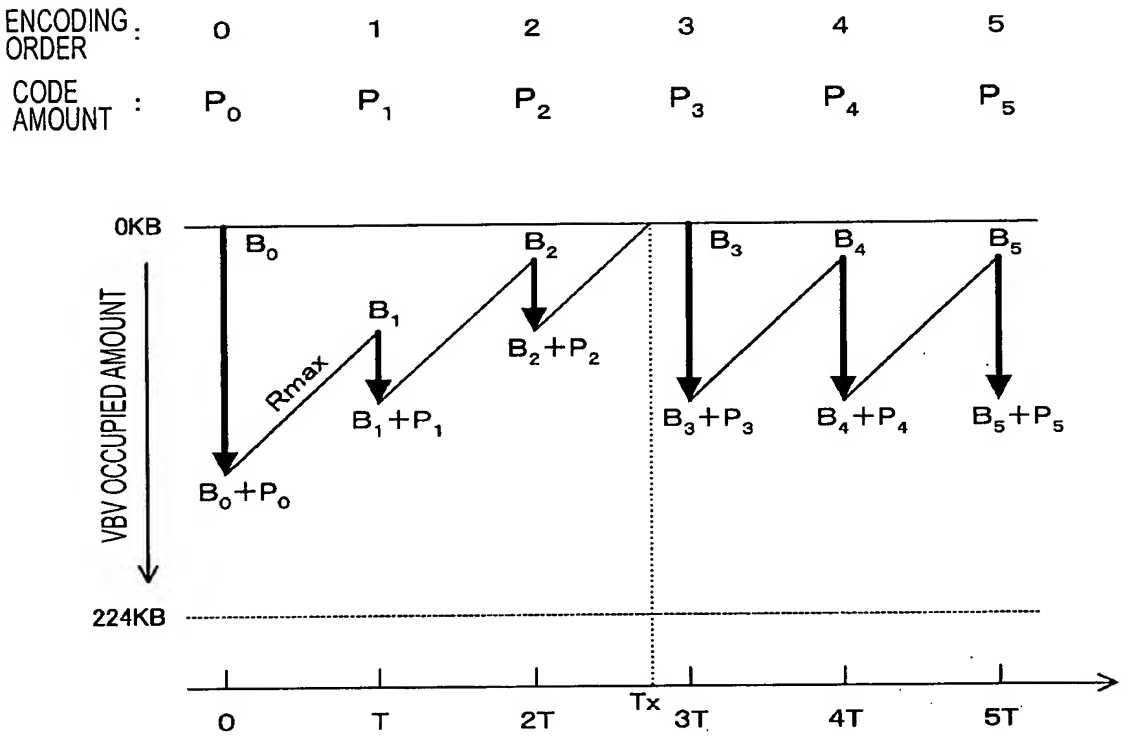
ENCODING ORDER : 0 1 2 3 4 5
CODE AMOUNT : P_0 P_1 P_2 P_3 P_4 P_5
0KB
VBV OCCUPIED AMOUNT
224KB
B_0
B_1
B_2
B_3
B_4
B_5
Rmax
B_0+P_0
B_1+P_1
B_2+P_2
B_3+P_3
B_4+P_4
B_5+P_5
0
T
2T
Tx
3T
4T
5T

FIG. 4

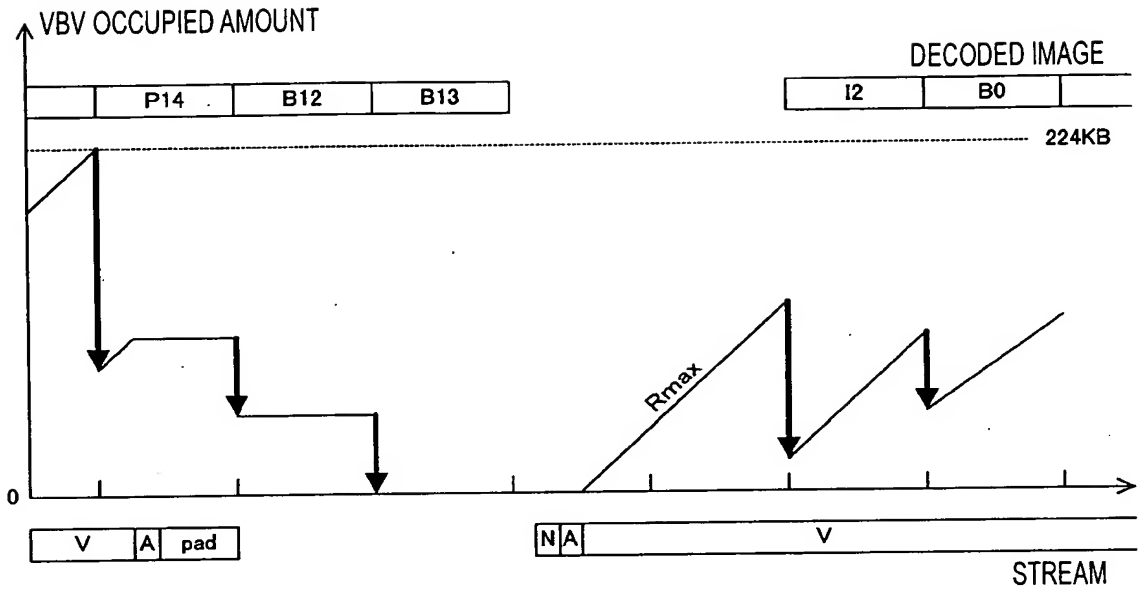
VBV OCCUPIED AMOUNT
DECODED IMAGE
P14
B12
B13
I2
B0
224KB
Rmax
0
V
A
pad
N
A
V
STREAM

FIG. 5A

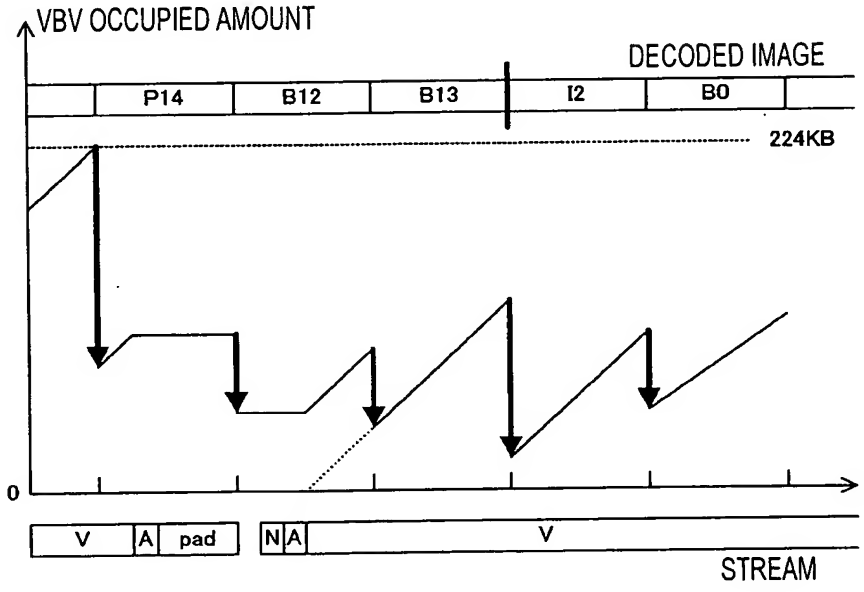
VBV OCCUPIED AMOUNT
DECODED IMAGE
P14
B12
B13
I2
B0
224KB
0
V
A
pad
N
A
V
STREAM

FIG. 5B

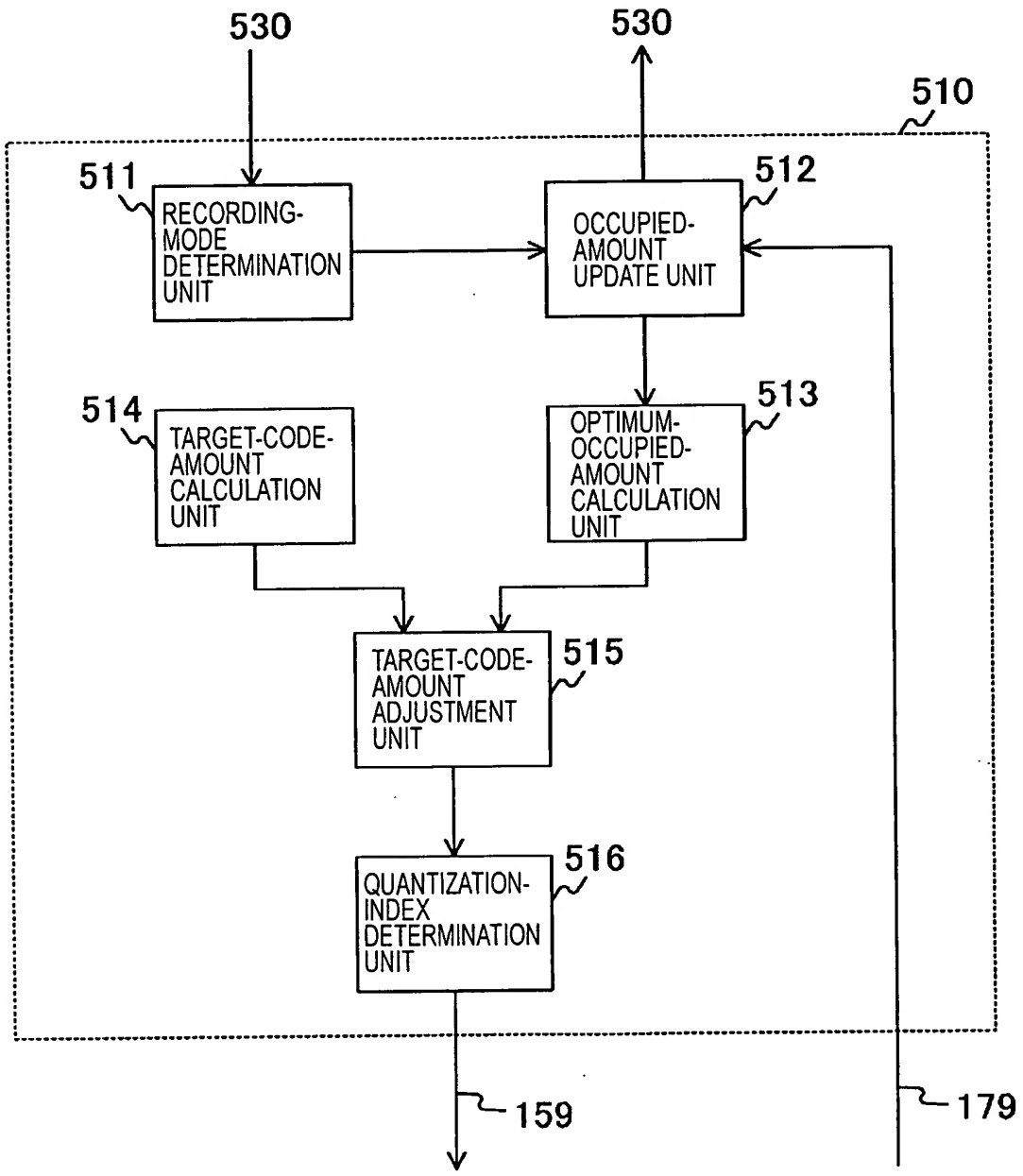
530
530
510
511
RECORDING-MODE DETERMINATION UNIT
512
OCCUPIED-AMOUNT UPDATE UNIT
514
TARGET-CODE-AMOUNT CALCULATION UNIT
513
OPTIMUM-OCCUPIED-AMOUNT CALCULATION UNIT
TARGET-CODE-AMOUNT ADJUSTMENT UNIT
515
QUANTIZATION-INDEX DETERMINATION UNIT
516
159
179

FIG. 6

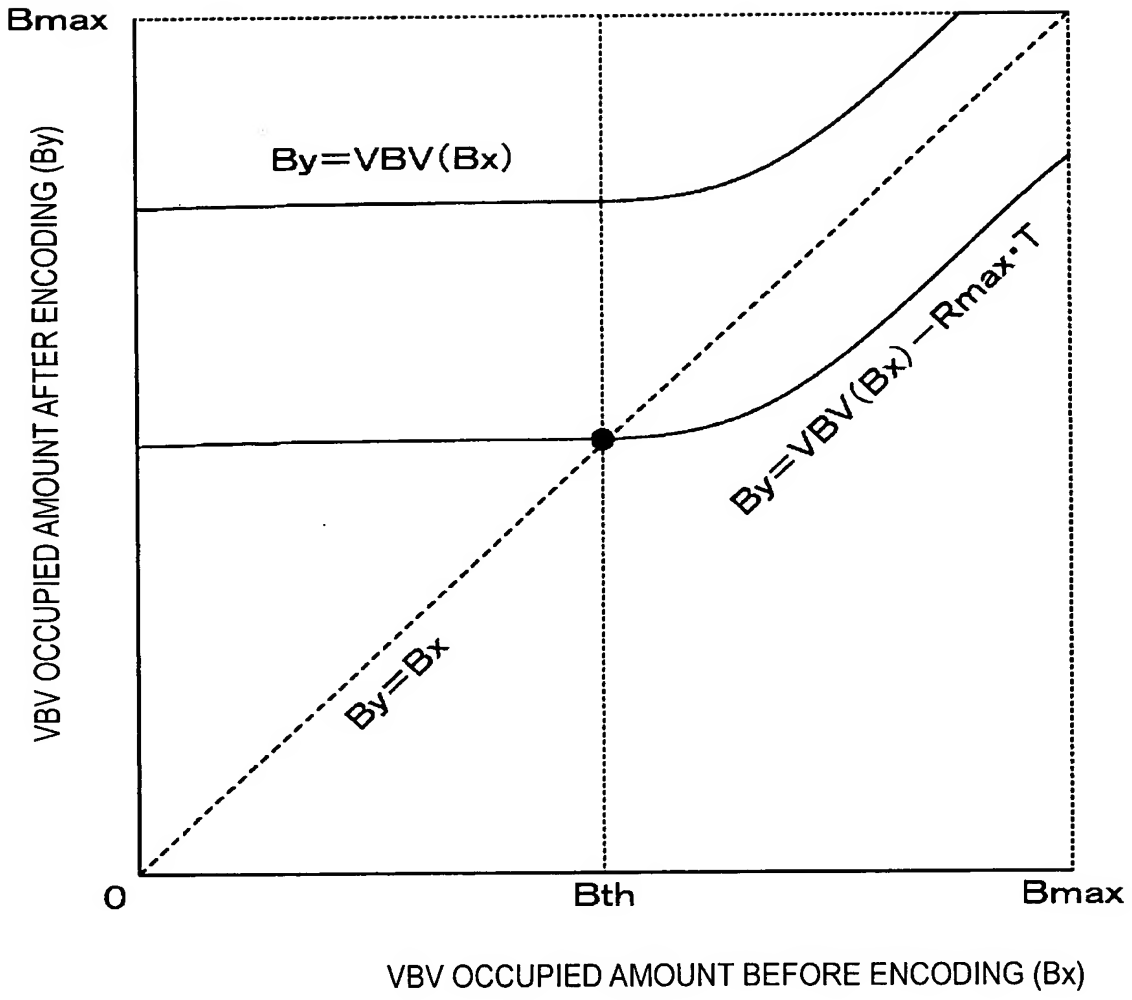
Bmax
By=VBV(Bx)
By=VBV(Bx)−Rmax·T
By=Bx
VBV OCCUPIED AMOUNT AFTER ENCODING (By)
0
Bth
Bmax
VBV OCCUPIED AMOUNT BEFORE ENCODING (Bx)

FIG. 7

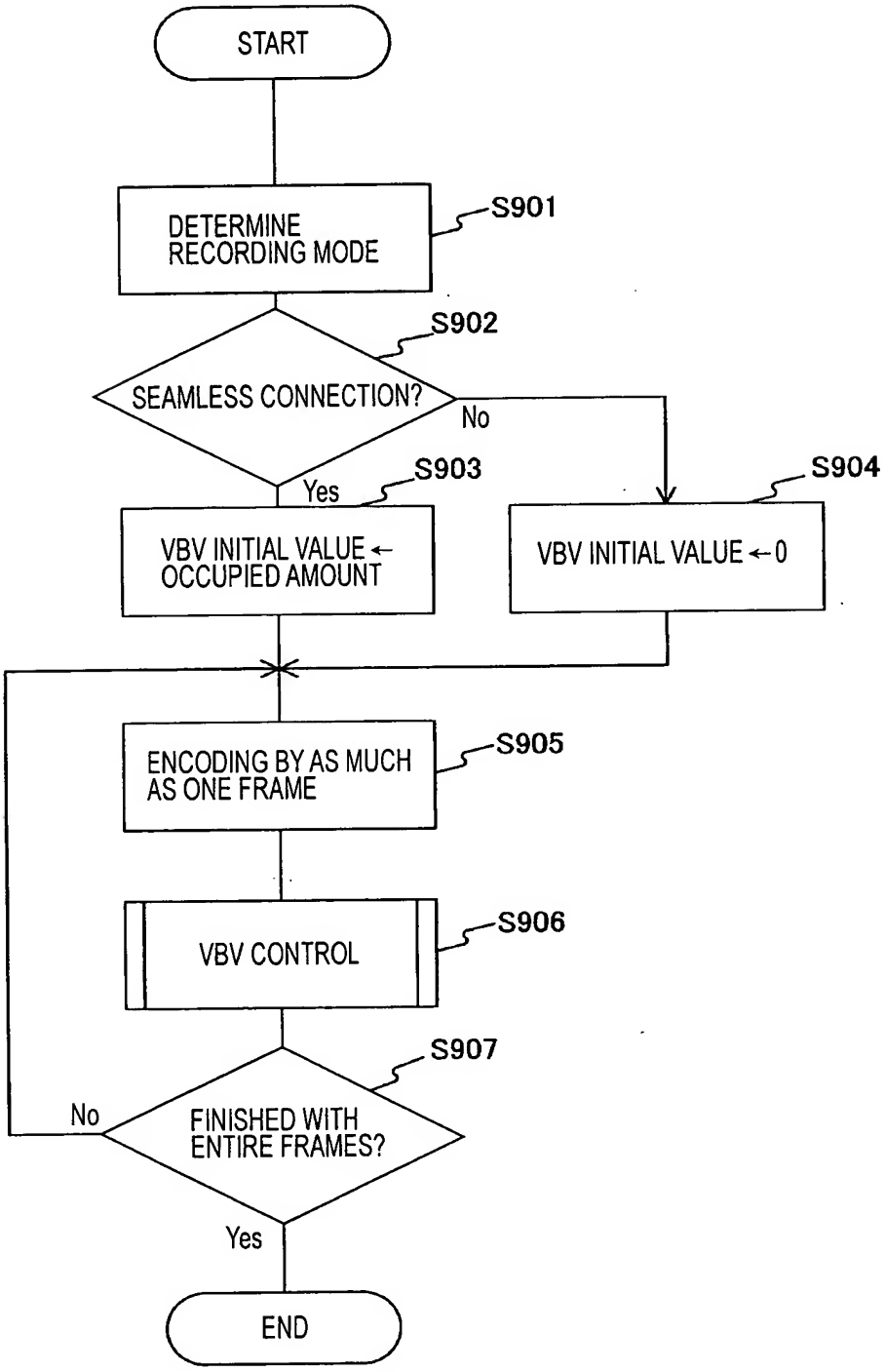
START
DETERMINE RECORDING MODE
S901
SEAMLESS CONNECTION?
S902
No
Yes
S903
VBV INITIAL VALUE ← OCCUPIED AMOUNT
S904
VBV INITIAL VALUE ← 0
ENCODING BY AS MUCH AS ONE FRAME
S905
VBV CONTROL
S906
FINISHED WITH ENTIRE FRAMES?
S907
No
Yes
END

FIG. 8

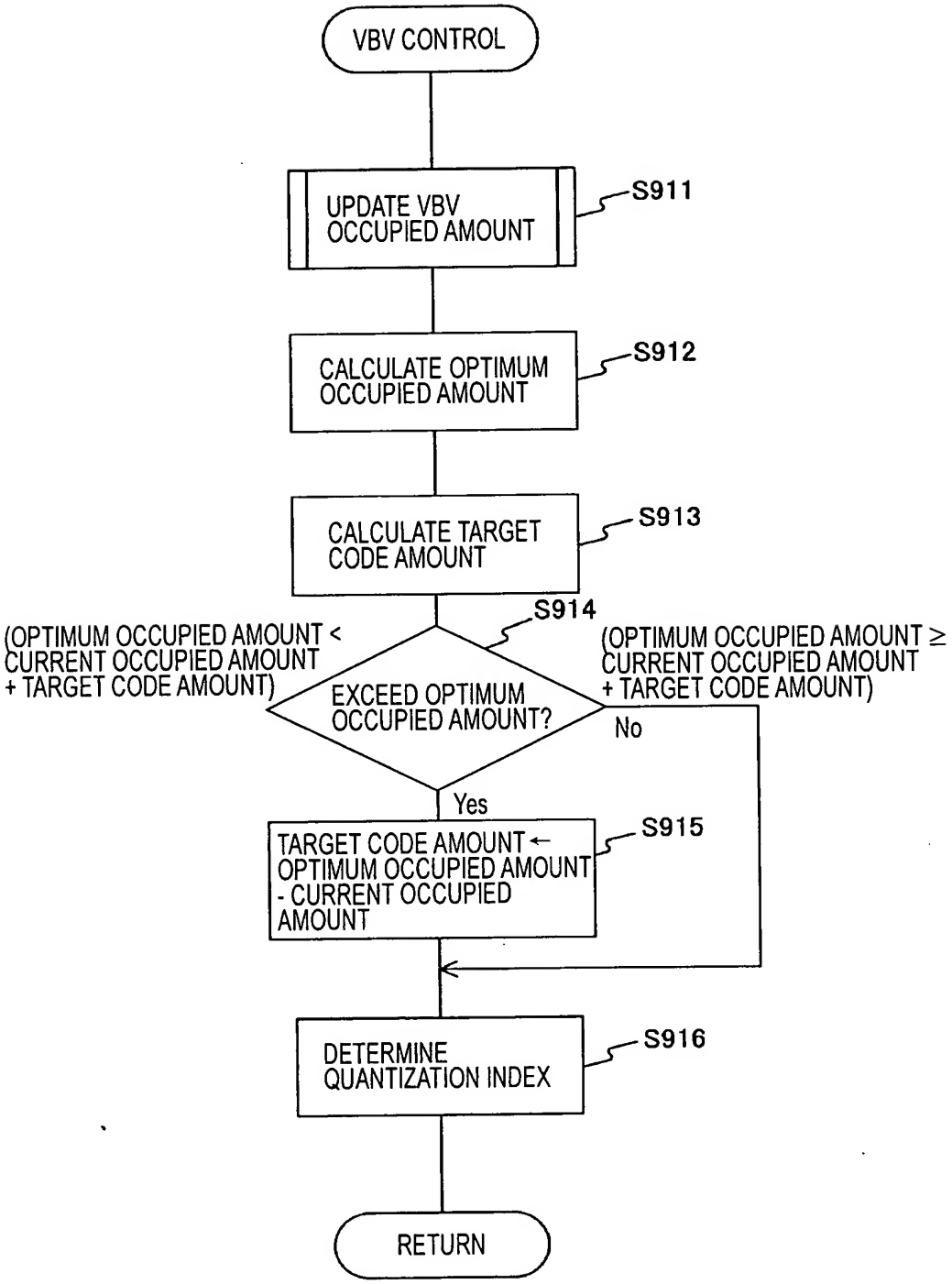
VBV CONTROL
UPDATE VBV OCCUPIED AMOUNT
S911
CALCULATE OPTIMUM OCCUPIED AMOUNT
S912
CALCULATE TARGET CODE AMOUNT
S913
S914
(OPTIMUM OCCUPIED AMOUNT < CURRENT OCCUPIED AMOUNT + TARGET CODE AMOUNT)
EXCEED OPTIMUM OCCUPIED AMOUNT?
(OPTIMUM OCCUPIED AMOUNT ≥ CURRENT OCCUPIED AMOUNT + TARGET CODE AMOUNT)
No
Yes
TARGET CODE AMOUNT ← OPTIMUM OCCUPIED AMOUNT - CURRENT OCCUPIED AMOUNT
S915
DETERMINE QUANTIZATION INDEX
S916
RETURN

FIG. 9

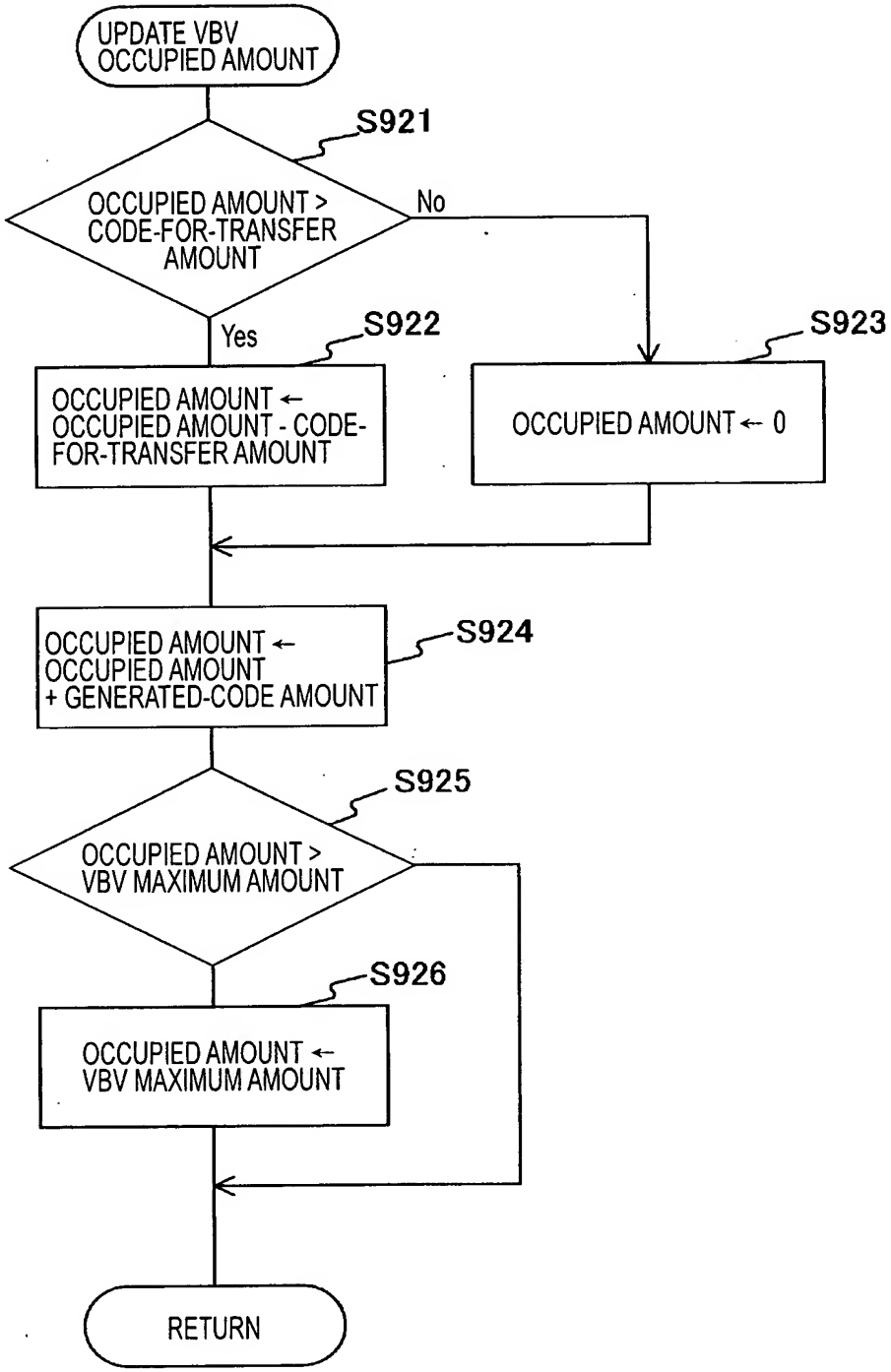
UPDATE VBV OCCUPIED AMOUNT
S921
OCCUPIED AMOUNT > CODE-FOR-TRANSFER AMOUNT
No
Yes
S922
OCCUPIED AMOUNT ← OCCUPIED AMOUNT - CODE-FOR-TRANSFER AMOUNT
S923
OCCUPIED AMOUNT ← 0
S924
OCCUPIED AMOUNT ← OCCUPIED AMOUNT + GENERATED-CODE AMOUNT
S925
OCCUPIED AMOUNT > VBV MAXIMUM AMOUNT
S926
OCCUPIED AMOUNT ← VBV MAXIMUM AMOUNT
RETURN

FIG. 10